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ABSTRACT

Classroom activities are presented to help teachers introduce general controversial issues and specific issues on nuclear power in their high school science, social studies, and English classes. Objectives are to help students understand the various techniques of persuasion; the relationship between bias, persuasion, and fact; how these techniques can serve as foundations for critical thinking; and their own assumptions regarding what is true about nuclear energy. Activities are arranged into two major parts. The first part, focusing on techniques of persuasion, consists of six lessons that present various activities to help students understand how they are influenced by and are able to influence others in subtle ways. In the activities, students examine bias and facts, the appeal of advertisements, techniques of persuasion, propaganda, and specific persuasive techniques used in the nuclear power controversy. The next section, on valuing techniques, presents many activities to help students recognize their personal values and how these values influence rational decision-making. Included are values clarification activities, a five-step value analysis activity, examples of moral dilemmas, and worksheets on how to handle these moral dilemmas. Lessons provide clear directions and are presented in a format that includes worksheets, quizzes, and illustrations. (LH)

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KNOW NUKES:
A Nuclear Power Issues Curriculum Project

Antioch/New England Graduate School
Keene, New Hampshire 03431

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Brattleboro Reformer, April 30, 1981

Terry Sprague

NO DANGER — Instead of radioactive waste, the barrel above and two others found Tuesday at the Elliot Street playground contained only a bit of safflower oil.

Yankee Barrel Prank Has Officials Upset

By TERRY SPRAGUE

Was it an elaborate prank or a deliberate attempt to get the Vermont Yankee Nuclear Power Corp. in trouble?

Whatever the motive, someone painted three large barrels with a radiation warning sign and the labels "rad (radioactive) waste" and "Vermont Yankee" and then put them on a children's playground on Elliot Street.

That act drew the ire of the nuclear plant's officials.

On the other hand, Brattleboro police who investigated the barrels said they considered them nothing but a prank that was in bad taste.

The three 55-gallon barrels were found by members of the Parks and Recreation Department Tuesday morning. When the barrels were opened, police said they found nothing but some safflower oil, which matched the original labels on the containers.

Police say they do not know who dumped the barrels, but said no crime was committed.

Yankee officials disagree, however, saying that it is a violation of a federal law to mislabel contents with a radiation warning. The fine may be as high as $5,000 per incident, Yankee spokesman Stephen Bravar said today. Bravar criticized those responsible for the incident.

"Whoever dumped those barrels was obviously out to damage the credibility of Vermont Yankee," he said. "This was no kid's lark."

Bravar said that the person or persons responsible "were fabricating an incident to once again sling mud at Yankee."

The Yankee spokesman noted that in March the media made "a big thing" out of a Yankee barrel that had floated down the Connecticut River to Northampton, Mass. Like many of the clean barrels that contained non-toxic materials from the plant, that barrel probably had been sold by the plant and was being used as part of a floating dock on the river, Bravar said. The barrel probably had broken free and drifted down the river, he added.

The latest incident has a non-nuclear twist. The three barrels found on the Elliot Street playground have been cut in half by members of the Brattleboro Fire Department who plan to use them for charcoal grills.

Brattleboro, Vermont, residents awoke to this front page article on April 30, 1981. Someone had placed these drums in a local park to draw attention to nuclear waste problems. Is this an effective way to influence public opinion? Would this make you think twice about the local nuclear power plant? Or would it influence you to think that anti-nuclear activists placed the local utility at an unfair disadvantage? Was this a legitimate act of political persuasion? Was this a moral or an immoral act?

This guide provides curriculum ideas for dealing with questions such as these. The nuclear power debate is a myriad of facts and fantasies woven together into a confusing fabric of information, ideas, and values. How can teachers and other community educators help their students and themselves unravel the threads of this controversial issue?

INTRODUCTION

The nuclear power controversy represents one of the most complex political dilemmas that affects the future of this nation. For some people, nuclear power is a prolific energy source that can solve America's energy problems well into the twenty-first century. Nuclear power can help us maintain a stable economy and provide the foundation for an energy-rich, affluent society. For others, the risks of nuclear power are sufficiently severe to pose the most dangerous health risk of any technology ever used by humans and this risk warrants the eventual abandonment of nuclear power. Many other people have an opinion somewhere in between these extremes. The nuclear power debate has become stereotyped around these polar positions and typically the controversy includes propaganda and bias that obscure meaning.

The **KNOW NUKES INSTITUTE** was held at Antioch/New England Graduate School in Keene, New Hampshire, in July of 1982. It was organized out of the assumption that important national controversial issues must be taught in the nation's classrooms. Teachers and students shy away from these issues because they are overwhelmed by difficult technical material or because they are unwilling or do not have the support to bring controversy into the classroom. The primary goal of the **KNOW NUKES INSTITUTE** was to train teachers to introduce the nuclear power controversy into their science, social studies, and english classes. We felt that this could best be accomplished by developing a training model which included speakers and texts that represented a wide spectrum of opinion. The advisory group for the **KNOW NUKES** project included representatives of the nuclear power industry, representatives from citizen activist groups opposed to the further development of nuclear power, and professional educators. This group designed a balanced program that encouraged controversy. An important part of the model was the inclusion of various events, activities, and media presentations that trained teachers in more than just the technical aspects of nuclear power, but also in developing teaching techniques for introducing the nuclear power controversy.

A tangible result of the **KNOW NUKES** approach to nuclear issues is this collection of classroom activities developed as a part of the institute. The activities are arranged in two parts. Part One is about techniques of persuasion. It consists of a sequence of lessons that will help students understand how they are influenced by and are able to influence others in subtle ways. Part Two is about valuing techniques. It contains many examples of methods that are used to help students recognize their personal values and how values are involved in making rational decisions.

Taken together, techniques of persuasion and valuing methods comprise an approach that is essential in the kind of teaching the nuclear controversy calls for. The approach is applicable to many societal issues, of course, but is especially pertinent to the national nuclear power debate.

Regardless of the complex questions nuclear power raises, decisions have to be made. To do nothing is not one of our options. Active consideration of opposing points of view will clarify the factors that influence our decision-making and lead to rational, sound decisions.

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TECHNIQUES OF PESUASION AND THE NUCLEAR POWER CONTROVERSY

The average American watches six hours of television and is exposed to two thousand advertisements each day. These remarkable figures underscore the pervasive influence of the mass media in everyday life. Mass media influences behavior, modifies and shapes values, and affects the outcome of important political events. Americans are deluged by information gleaned from these sources which form the basis of opinions. How can we be sure these opinions are based on sound facts and careful reflection? How can we be sure that we are not susceptible to subtle forms of manipulation?

It is important for high school students to understand techniques of persuasion as they are used by the media and in all aspects of everyday life. The psychology of persuasion is extremely complex. It is not always clear whether someone is being persuaded or doing the persuading. But we do know that we spend a good deal of our time trying to persuade other people to agree with out point of view, to see things the same way we do, to act according to our expectations. Similarly, we are barraged by a morass of persuaders telling us to buy something or to vote for somebody or to act in a particular way. We all develop various techniques to accommodate our persuasive purpose. Sometimes we are conscious of those techniques, other times they are more subtle, perhaps unconscious, part of a complex interpersonal dynamic that is beyond conscious reflection.

One of the main objectives of the **KNOW NUKES** project was to help teachers introduce controversial issues in the classroom. Our assumption is that students are more capable of making sound decisions if they are aware of their biases and are able to distinguish fact from propaganda. We feel that this cannot be accomplished without examining the role of bias, propaganda, and ideology in controversial topics. The nuclear power controversy is replete with hidden biases that distort supposedly objective statements, propagandistic statements that are misrepresented as facts, and statements of deep ideological conviction that appear as fundamental truth.

The attempt to uncover bias is of great value to both teachers and students. It often forces people to take a fresh look at their convictions and to examine difficult issues in a fresh new light. High school students are at a critical stage in developing their identity and in forming opinions. The objective of the exercises that follow is to give students more insight into how they form their opinions.

Before we introduce these exercises, a few definitions are necessary:

BIAS refers to the attitudes, opinions, and values that an individual or organization brings to written text and oral conversation. In the case of nuclear power, both utilities and citizen activist groups often have very strong biases (nuclear power can solve our nation's energy problems....nuclear power plants are unsafe and should be shut down). It helps to know what that bias is before reading any text generated by either group.

PROPAGANDA refers to information that is designed to convey a specific point of view. Although propaganda is often disguised as a statement of fact, is it distinguished by virtue of its main intention: to convince the reader or listener to believe in certain information or ideas. It is important for the student to distinguish between propagandistic text and factual text.

IDEOLOGY is the most difficult concept of the three. By ideology, we refer to the basic assumptions that comprise an individual's view of the world. These are the basic foundations of social and cultural meaning, the basic truths that underly one's participation in everyday social life. It is very difficult to identify the ideological components of thought; because usually these assumptions are taken for granted, they are beyond questioning. For example, an important aspect of the nuclear power debate is the role of technology in solving environmental problems. Some people have a basic faith in technology and assume

that technology enables humans to enjoy a very high standard of life. These people may equate human progress with technological progress. Others distrust technology and believe that technology inherently leads to environmental disruption and human degradation. Of course, this is a simplification of a very complex argument; but, for illustrative purposes, it can be seen how either point of view can tremendously influence one's view of nuclear power. Ideological statements are often hidden in what are supposedly objective statements of fact.

By carefully analyzing and identifying techniques of persuasion, we can more clearly identify bias, persuasion, and ideology. We don't expect that these exercises will enable students to thoroughly understand such sophisticated and complex ideas. We do think they can be introduced at a basic level and that such a basic understanding will not only be useful in social studies classes but will also be of great relevance in science classes because students will be able to exercise clear thinking and sound analysis.

These exercises and lessons are designed to serve as a foundation for a one- or two-week unit on techniques of persuasion. They are ideally suited to introduce a much longer unit on nuclear power or general energy issues. We have assumed that teachers from different disciplines will use this material with students of various levels of sophistication. Consequently, we have compiled some basic exercises which could probably be used by seventh or eighth graders, but would also be useful for older students if supplementary material is provided.

Objectives

1. To help students understand the various techniques of persuasion that are used to communicate information about nuclear energy.
2. To demonstrate how an understanding of these techniques can serve as a foundation for critical thinking.
3. To help the student understand his/her own assumptions regarding what is true about nuclear energy.
4. To help the student understand the relationship between bias, persuasion, and fact.

LESSON ONE:
BIAS AND FACTS

In this exercise, students indicate their stand on nuclear power by marking the following value continuums. Various statements are taken from articles and advertisements about nuclear power.

This exercise serves not only to help students understand their preconceptions about nuclear power, but it also serves as a pre- and post-test exercise. Students may find that they have no opinion because they don't understand the comment. Certainly that should be instructive for the teacher. In some cases, there is no "right" answer. At the end of an extended unit on nuclear power and techniques of persuasion, teachers should return to this exercise, both to determine how much the students have learned about nuclear power and to see whether they can detect bias in the formulation of the statement.

WORKSHEET 1

The following list includes pairs of statements. For each statement, put a mark on the line to show where you stand in relation to each issue.

1. Nuclear power is necessary to meet the nation's growing energy needs.	The need for energy can be met without nuclear power.
1 ——— 10	
2. The risk of nuclear power is small.	The risk of nuclear power is great.
1 ——— 10	
3. There is no danger of an atomic explosion in a nuclear power plant.	There is a great danger of an atomic explosion in a nuclear power plant.
1 ——— 10	
4. The technical means of high level nuclear waste disposal are currently available.	High level nuclear waste disposal is an unsolved technical problem.
1 ——— 10	
5. Nuclear power provides many jobs for a long time.	Nuclear power plants provide many jobs but for a very short time.
1 ——— 10	
6. Nuclear energy is vital for reducing our nation's dependence on imported oil.	Nuclear energy has not and will not reduce dependence on imported oil.
1 ——— 10	
7. Nuclear plants have the best safety record of any major energy technology in America.	Nuclear plants have had many potentially dangerous accidents and are far more dangerous than other energy technologies.
1 ——— 10	
8. Nuclear power does not produce any pollution.	Nuclear power results in a great deal of pollution.
1 ——— 10	
9. Uranium is a very safe material to mine and transport if proper safety measures are taken.	Uranium cannot be mined or transported safely.
1 ——— 10	
10. The United States is the only country in the world where there are nuclear power plants.	Many countries the world over have nuclear power plants.
1 ——— 10	
11. Low-level radiation is extremely dangerous.	Low-level radiation does not pose health and safety threats.
1 ——— 10	

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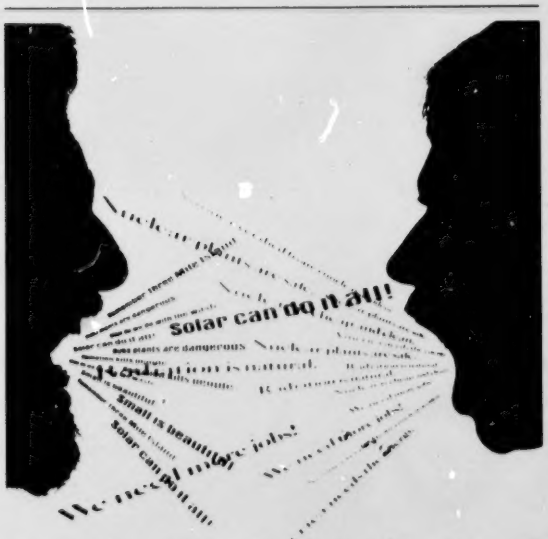
LESSON TWO:
THE APPEAL OF ADVERTISEMENTS

As a previous night's homework assignment, ask your students to look through some magazines with the purpose of finding one special advertisement that they find to be particularly appealing. You might be more specific in describing the nature of the appeal. Explain to the student that s/he should really desire the product that is advertised, or that s/he would very much like to be the person in the ad or a part of the scene that the ad describes.

Hand out a Lesson Two Worksheet and ask each student to write down five reasons or features which are most attractive about the advertisement. After that is completed, divide the students into pairs and have these pairs work together for the remainder of the lesson:

1. Have the students share their advertisements with their partners and let them explain to each other why they found their advertisement so attractive.
2. Have each member of the pair explain to his/her partner one way the partner might have been unknowingly persuaded by the advertisement.
3. Together, both students should try to jointly fill out column three of the worksheet. They should try to figure out how the advertisement tries to get them to think a certain way.

As a teacher directed activity, ask the class to figure out the different ways that they might have been influenced by the advertisements. Synthesize these comments and point out any general themes. Collect the advertisements and put them on the class bulletin board.



Which Side Do You Believe?

Nuclear Power. Because America Needs Energy.

Reprinted with the kind permission of the Edison Electric Institute.

IS THIS CRICKET?

In a massive attempt to persuade the people of Britain that nuclear power is good for them, the nuclear industry is spending £5 million a year on advertising and promotion.

Besides spending over £50,000 on their travelling "Atoms for Energy" exhibitions, they have also advertised in school children's magazines and even given free badges to children.

This year, they'll be spending £200,000 on an advertising campaign aimed at a group they have identified as the strongest opponents of nuclear power - women.

You're paying for much of this in your taxes and your electricity bills.

But with your help, we could turn a big propaganda whitewash into a fair debate. Friends of the Earth want to even up the score by making the case against nuclear power.

All we want to see is fair play.

Join Friends of the Earth in the fight against nuclear power.

For more information write to us.

FRIENDS OF THE EARTH, 9 POLAND STREET, LONDON W1V 3DG

FOE AUSTRALIA FOE CANADA FOE USA

Reprinted with the kind permission of Friends of the Earth.

WORKSHEET TWO

Instructions: Carefully look at the advertisement which you brought to class. Answer the following questions about the advertisement:

Five features about this advertisement that attract me are:	The reason why I like each of these features is:	Five ways in which the advertisement might have influenced me are:
1.		
2.		
3.		
4.		
5.		

LESSON THREE:
INTRODUCTION TO TECHNIQUES OF PERSUASION

The purpose of this lesson is to introduce the students to some ways they are manipulated by advertisements. Lesson Three should take the form of a mini-lecture in which the teacher introduces the basic concepts. We have provided the teacher with a general outline of the concepts involved. The outline provides enough information to serve as a basis for student discussion. This material has been drawn from the excellent unit on advertising that was developed by Hugh Rank at Governors State University (Park Forest South, Illinois).

We have listed four common techniques of persuasion which should be described and illustrated for your students. For each technique, we have also listed specific sub-categories which you might introduce depending on the sophistication of your students.

1. Attention (stop! grab it!)
- A. Slogans—"We do it all for you!"
- B. Sensory images—colors, bold type, catchy tunes

This is the technique which catches the person's attention and draws him/her to the ad. The purpose is to cause the person to find out what is being said.

2. Confidence (Trust me!)
- A. Camaraderie—"The Pepsi Generation"
- B. Recognition—Sports stars, movie stars
- C. Status—The "in" crowd

The person reading this ad feels that there is good reason to believe the speaker or the people pictured in the advertisement, either because they trust those people or identify with them.

3. Desire (You need it!)
- A. Exaggeration—"I'd walk a mile for a camel"
- B. Prejudice—"Blondes have more fun"
- C. Numbers—"Nine out of ten doctors recommend"
- D. Sensory images—pleasing pictures

This technique entices the person into believing that they must have the advertised item.

4. Urgency (Hurry up!)
- A. Exaggeration—"Last chance, everything must go"
- B. Numbers—"Twelve days until Christmas"

This technique demands or suggests the need for quick action. The person is led to believe that s/he will miss a great opportunity if quick action is not taken.

All of these techniques are designed to get the reader or watcher of the advertisement to respond in a specific way. After presenting these techniques of persuasion, the teacher should ask the students to consider what their response is to the various advertisements. How do the advertisements make you feel? Do they prompt you to take some kind of action? (Buy something, join a political party, etc.)

the 30-SECOND SPOT quiz

Use this 1-2-3-4-5 sequence of questions, based on Hugh Rank's pattern of **"the pitch"** (HI/Trust Me/You Need/Hurry/Buy), to focus on the *"skeleton"* underneath the *"surface variations"* of radio and TV commercials, newspaper and magazine ads.

1 What ATTENTION-GETTING techniques are used?

Anything unusual? Unexpected? Noticeable? Interesting? Related to:

- ☐ **senses:** motions, colors, lights, sounds, music, visuals (e.g. computer graphics, slow-motion)
- ☐ **emotions:** any associations *(see list below):* sex, scenery, exciting action, fun, family, pets.
- ☐ **thought:** news, lists, displays, claims, advice, questions, stories, demonstrations, contest.

(*Popular TV* **programs** *function as* attention-getters *to "deliver the audience" to advertisers.)*

2 What CONFIDENCE-BUILDING techniques are used?

- ☐ Do you *recognize, know* (from earlier repetition) the **brand name? company? symbol? package?**
- ☐ Do you *already know, like,* and *trust* the **"presenters":** the endorsers, actors, models?
- ☐ Are these "presenters" **AUTHORITY FIGURES** (expert, wise, protective, caring,)? Or, are they **FRIEND FIGURES** (someone you like, like to be, "on your side"; incl. "cute" cartoons)?
- ☐ What key **words** are used? (*Trust, sincere,* etc.) **Nonverbals?** *(smiles, voice tones, sincere look)*
- ☐ In **mail** ads, are computer-written *"personalized"* touches used? On **telephone:** tapes? scripts?

3 What DESIRE-STIMULATING techniques are used? (Main part of ad)

Consider (a) **"target audience"** as (b) **benefit-seeking;** and persuaders benefit-promising strategies as focused on (c) **product claims,** or, (d) **"added values"** associated with a product.

☐ a. **Who is the "target audience"?** Are *you?* (If *not,* as part of an unintended audience, are you *uninterested* or *hostile* toward the ad?)

☐ b. **What's the primary motive of that audience's benefit-seeking?** Use chart at right. Most ads are simple acquisition (*lower left*). Often, such motives co-exist, but one may be dominant. Ads which intensify a **problem,** (that is, a "bad" already hated or feared; *the opposite, or the absence of,* "goods") and then offer the product as a **solution,** are here called **"scare-and-sell"** ads. (*right side*).

To keep a "good" *(protection)*	**To get rid of a "bad"** *(relief)*
To get a "good *(acquisition)*	**To avoid a "bad"** *(prevention)*

☐ c. **What kinds of product claims are emphasized?** *(Use these 12 categories)* What key words,images? Any *measurable* claims? Or are they *subjective opinions, generalized* praise words ("puffery")?

SUPERIORITY *("best")* BEAUTY *("lovely")* STABILITY *("classic")* UTILITY *("practical")*
QUANTITY *("most")* SCARCITY *("rare")* RELIABILITY *("solid")* RAPIDITY *("fast")*
EFFICIENCY*("works")* NOVELTY *("new")* SIMPLICITY *("easy")* SAFETY *("safe")*

☐ d. **Are any "added values" implied or suggested?** Are there words or images which associate the product with some "good" already loved or desired by the intended audience? With such common human needs/wants/desires as in these 24 categories:

"basic" needs:
FOOD *("tasty)*
ACTIVITY *("exciting")*
SURROUNDINGS *("comfort")*
SEX *("alluring")*
HEALTH *("healthy")*
SECURITY *("protect ')*
ECONOMY ("save")

"certitude" needs:
RELIGION *("right")*
SCIENCE *("research")*
BEST PEOPLE *("elite")*
MOST PEOPLE *("popular")*
AVERAGE PEOPLE *("typical")*

"territory" needs:
NEIGHBORHOOD *("hometown")*
NATION *("country")*
NATURE *("earth")*

love & belonging needs:
INTIMACY *("lover")*
FAMILY *("Mom" "kids")*
GROUPS *("team")*

"growth" needs:
ESTEEM *("respected")*
PLAY *("fun")*
GENEROSITY *("gift")*
CREATIVITY *("creative")*
CURIOUSITY *("discover")*
COMPLETION *("success")*

4 Are there URGENCY-STRESSING techniques used? *(Not all ads, but always check.)*

☐ If an urgency appeal: What words? *(e.g. Hurry, Rush, Deadline, Sale Ends, Offer Expires, Now.)*
☐ If **no** urgency: is this **"soft sell"** part of a *repetitive, long-term ad campaign* for standard item?

5 What RESPONSE-SEEKING techniques are used? (*Persuaders always seek some kind of response!)*

☐ *Are there specific triggering* words used? (Buy, Get, Do, Call, Act, Join, Smoke, Drink, Taste, etc.)
☐ Is there a **specific response** sought? (Most ads: to buy something)
☐ If **not:** is it **conditioning** ("public relations" or "image building") to make us **"feel good"** about company, to get favorable public opinion on *its* side (against any government regulations, taxe

Based on *The Pitch* © 1982 by Hugh Rank (Teachers may photocopy for classroom use.)

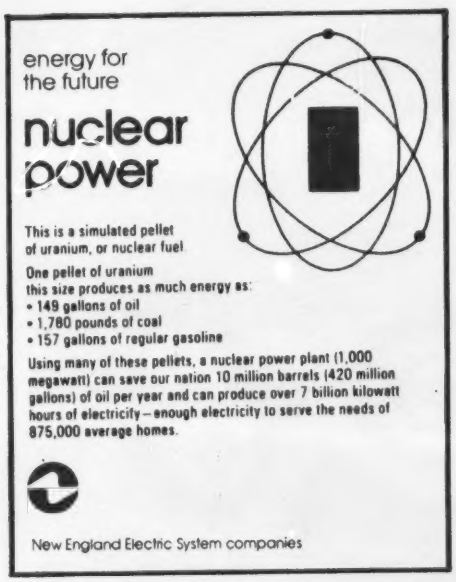
LESSON FOUR:
HOW TO ANALYZE ADVERTISEMENTS

The purpose of this lesson is to have the students apply what they learned in the lecture by reconsidering the advertisements which they originally collected. The students should retrieve their advertisements and analyze them according to the scheme developed in Lesson Three.

There are many questions which you can ask the students to help them think about the role of advertising in their lives. Have them consider the following ideas and questions:

1. How many advertisements do you see each day?
2. Is there a difference between television advertisements, billboards, and magazine advertisements? Which are the most effective?
3. Who designs advertisements?
4. What makes for a good advertisement?
5. How often do you read advertisements? How important are they in helping you make up your mind about something?
6. Can you imagine a world without advertisements? What would it be like? Would you like to live in that kind of world?

Hand out the following worksheets to the students and ask them to analyze their advertisements following the worksheet guidelines. If time permits, they can analyze their classmates' advertisements as well.


energy for
the future
nuclear
power
This is a simulated pellet
of uranium, or nuclear fuel
One pellet of uranium
this size produces as much energy as:
• 149 gallons of oil
• 1,780 pounds of coal
• 157 gallons of regular gasoline
Using many of these pellets, a nuclear power plant (1,000 megawatt) can save our nation 10 million barrels (420 million gallons) of oil per year and can produce over 7 billion kilowatt hours of electricity—enough electricity to serve the needs of 875,000 average homes.
New England Electric System companies

LESSON FOUR WORKSHEET

Using your advertisement, answer the following questions:

1. How does this advertisement grab my attention?

Does it use any of the following techniques?

_____ Slogans
_____ Sensory Images

2. Why do I trust this advertisement?

Does it use any of the following techniques?

_____ Camaraderie
_____ Recognition
_____ Status

3. Why do I want what is in this advertisement?

Does it use any of the following techniques?

_____ Exaggeration
_____ Prejudice
_____ Numbers
_____ Sensory Images

4. What does this advertisement make me want to do?

Does it use any of the following techniques?

_____ Exaggeration
_____ Numbers

SEE LESSON FIVE

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Nuclear plants are safe.
Remember Three Mile Island.
Nuke plants are dangerous.
What do we do with the waste
Solar can do it all!
Nuke plants are dangerous.
Radiation kills people.
Radiation is natural.
Small is beautiful.
We need more jobs!
Solar can do it all!
Nuclear plants are safe.
Nuclear is cheap and clean.
America needs the energy.
Radiation is natural.
Nuclear is cheap and clean.
We need more jobs!
Radiation kills people.
Small is beautiful.
Remember Three Mile Island.
Solar can do it all!
We need more jobs!

Which Side Do You Believe?

There are two sides to the issue of nuclear power. Both sides feel strongly that their position is correct—which makes it difficult for Americans to form a responsible position on whether our country needs this source of energy.

Americans are bombarded with conflicting views and statements from numerous self-proclaimed energy experts. Some have even said that nuclear power—which currently provides 12% of the nation's electricity—should be halted altogether.

But consider the *sources* of the loudest anti-nuclear noise. Among those leading the attack on nuclear power are a host of actors and actresses, rock stars, aspiring politicians and others who think America has grown enough.

The Issue Isn't Just Nuclear

Nuclear power is not the only thing they oppose. These are often the same people who have been against development of geothermal energy in California . . . stopped new hydro-electric plants in Maine and Tennessee . . . blocked a new oil refinery for southern California . . . opposed new pipelines to deliver natural gas to the East . . . fought the building of more coal-fired plants. And they're the same people opposed to President Carter's plan for developing a synthetic fuels program. One wonders what they are *for*, and how they propose meeting America's energy needs?

For many of these people, stopping nuclear power is but one part of a political objective to slow growth across the board in America. This no-growth philosophy of the anti-nuclear leadership was clearly expressed by Amory Lovins, one of the world's leading nuclear critics, when he admitted, "If nuclear power were clean, safe, economic . . . and socially benign per se, it would still be unattractive *because of the political implications* . . ."

Support For Nuclear Widespread

On the other hand, consider the many organizations that have *endorsed* nuclear power for America's future. They include: the AFL-CIO . . . the NAACP . . . the National Governor's Conference . . . Consumer Alert . . . and many more. These groups recognize that America's need for electric power is growing at a rate of 4% each year.

Consider also that the health and safety record of nuclear power has been endorsed by a vast majority of the *scientific* community—including such organizations as the National Academy of Sciences, the World Health Organization, the American Medical Association, and the Health Physics Society.

We're not saying that nuclear power is risk free. The truth is that risks are involved in *all* energy technologies. However, the overwhelming scientific evidence is clear: nuclear power is at least as clean and safe as any other means available to generate electricity—more so than most.

Where will Americans get the electricity that is needed if not, in part, from nuclear power? That's the real question in the nuclear debate. It's the one for which the anti-nuclear leaders have no answer.

Nuclear Power. Because America Needs Energy.

America's Electric Energy Companies, Department 12, Post Office Box 420, Pelham Manor, New York 10803

IS THIS CRICKET?

In a massive attempt to persuade the people of Britain that nuclear power is good for them, the nuclear industry is spending £5 million a year on advertising and promotion.

Besides spending over £50,000 on their travelling "Atoms for Energy" exhibition, they have also advertised in school children's magazines and even given free badges to children.

This year, they'll be spending £200,000 on an advertising campaign aimed at a group they have identified as the strongest opponents of nuclear power – women.

You're paying for much of this in your taxes and your electricity bills.

But with your help, we could turn a big propaganda whitewash into a fair debate. Friends of the Earth want to even up the score by making the case against nuclear power.

All we want to see is fair play.

Join Friends of the Earth in the fight against nuclear power.

For more information write to us.

FRIENDS OF THE EARTH, 9 POLAND STREET, LONDON W1V 3DG

FOE AUSTRALIA –
366 Smith Street, Collingwood, Australia 3066

FOE CANADA –
53-54 Queen Street, Ottawa, Canada K1P 5C5

FOE USA –
124 Spear Street, San Francisco, California 94108

LESSON FIVE:
ADVERTISEMENTS AND PROPAGANDA

Until this point, the students have analyzed mainly product advertisements which are designed to sell particular products. It is unlikely that they generated any political advertisements. In recent years, many companies and political groups have designed what are called image advertisements. These ads are supposed to convince the reader or watcher of a particular point of view. We have chosen two image advertisements which deal with the nuclear power controversy. One is designed by the Edison Electric Institute, a pro-nuclear consortium of electric utilities. Another is designed by Friends of the Earth, an active environmentalist group that has offices worldwide.

For this lesson, the students will use the same worksheets that were handed out for Lesson Four. This time, they should be told that they are analyzing a different kind of advertisement, an image ad rather than a product ad.

After handing out the ads, the teacher should be sure to read the ads with the students because there may be words or ideas that they do not understand or have not been previously exposed to. These ads can be worked with in the following sequence:

1. Hand out the ads and have the students use the Lesson Four format to analyze them.
2. After the students have finished using the worksheets, ask them (as part of a class discussion) to consider which ad they feel is more effective. Ask them which ad they think is more believable.
3. Lead a discussion, explaining how various techniques of persuasion are often used to try to convince us that a particular point of view is the right point of view.

LESSON SIX:
TECHNIQUES OF PERSUASION AND THE NUCLEAR POWER CONTROVERSY

This activity is designed to give students more practice in identifying techniques of persuasion, but, in this case, they will examine various statements about nuclear power.

The activity should be introduced by elaborating the following scenario: Suppose that you live near an area that a utility wants to use as a site for a new nuclear power plant. Different interest groups are putting out both favorable and unfavorable information about the proposed plant.

Each student will be asked to evaluate twenty-four statements about nuclear power which have been culled from these interest groups' material. They will have to determine which particular technique of persuasion is reflected in each statement. In some cases, the material is straightforward; in other cases, many interpretations are possible. This should be the springboard for interesting further discussion.

LESSON SIX ACTIVITY SHEET: OPTIONAL ACTIVITY

If you have been able to identify the techniques of persuasion used in the various statements, see if you can determine whether each statement uses any of the following techniques: slogans, sensory images, camaraderie, recognition, status, exaggeration, prejudice, numbers. If any of these techniques have been used, write them in where you previously identified statements on the gameboard.

WORKSHEET 6

Activity instructions:

Each statement of information below uses a particular technique (or techniques) of persuasion to make its point. You are to match each statement with a square on the gameboard chart. Here's how you do it.

1. You will see that the gameboard chart is divided into a pro side and a con side.

2. Decide if the statement is a pro (for nuclear power) statement or a con (against nuclear power) statement. Once you have decided this you will know which side of the chart to use.

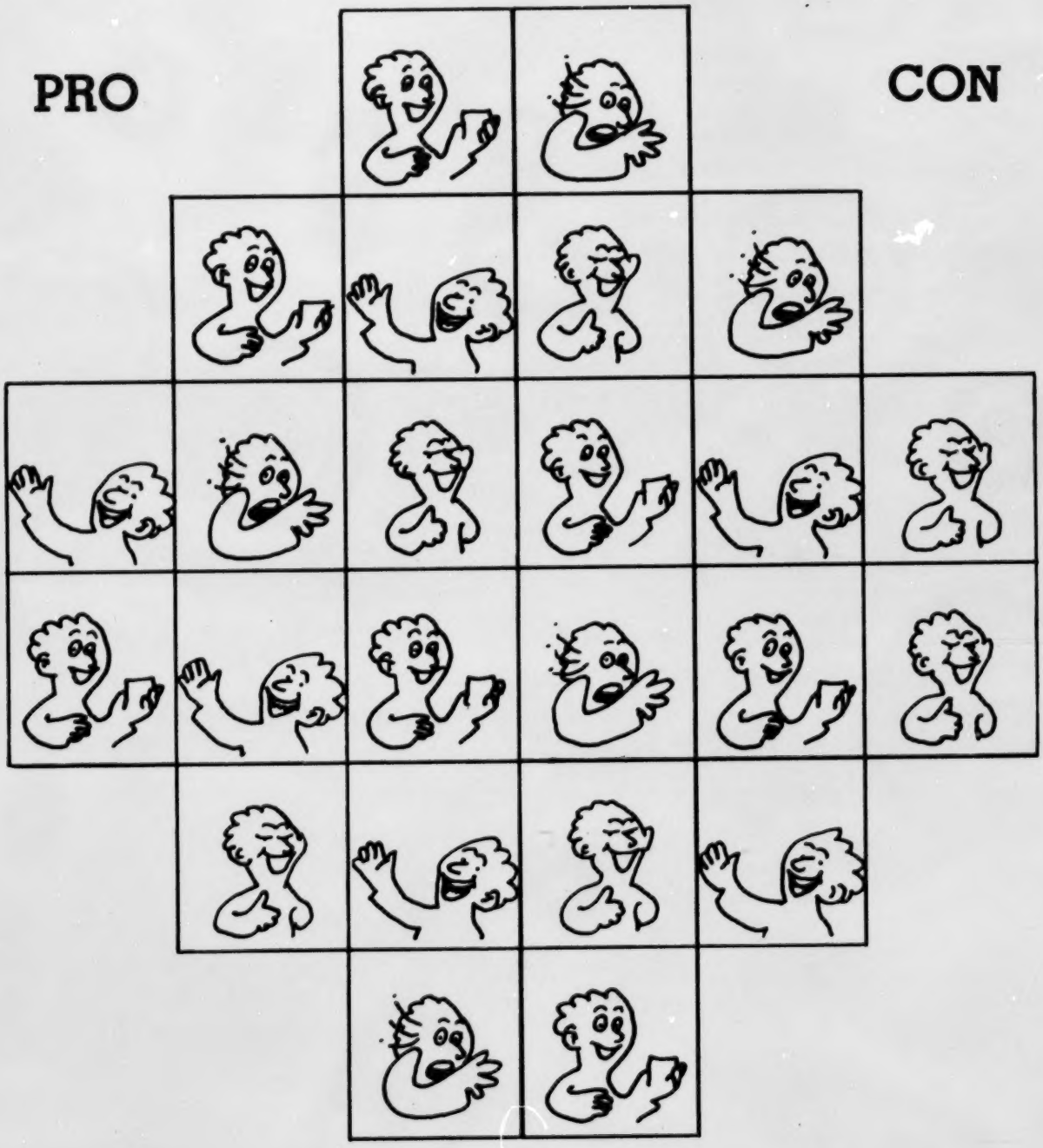
3. On the gameboard, there is a key which includes four boxes. Each box has a design which represents one of four techniques of persuasion (attention, confidence, desire, urgency). Try to determine which techniques of persuasion are used in the statement.

4. Write the number of the statement in one of the boxes on the side of the chart which you chose earlier (pro or con). The box should have the design which matches the key.

PERSUASION

PRO

CON



URGENCY

ATTENTION

DESIRE

CONFIDENCE

LESSON SIX:
STATEMENTS OF INFORMATION

1. America must produce its own energy. Our security and that of the free world may depend on it.
2. Solar is all right, but nukes do it all night.
3. Safe energy: the answer is blowing in the wind.
4. Nuclear power would like to put one New England business (Unemployment Division, Claims Office) out of business.
5. Plutonium is forever.
6. Electric power is without doubt the most pollution-free major source of energy available now or in the future.
7. The nuclear clock is at five minutes to midnight.
8. We're EXXON. We're Dale Silcox bringing Alaskan oil to the lower 48.
9. Let's face it. We can live without nuclear power.
10. Happiness is a day without nuclear power.
11. Come play in the nuclear power plant park.
12. Stop nuclear power before it stops you.
13. Pull the plug on foreign oil.
14. The chance of being killed by a nuclear reactor accident? One in five billion per year.
15. Spent Fuel Accident Devastating: Can Millions be Evacuated?
16. A nuclear power plant can save our nation 10 million barrels of oil per year and can produce more than 7 billion kilowatt hours of electricity.
17. The really nasty thing about radiation is that you can't see it or feel it or hear it or smell it or taste it or tell it to go away.
18. Today, over 30 percent of New England's electricity is produced by nuclear power plants, a leadership founded on the heritage of Yankee ingenuity.
19. In two decades of commercial nuclear power generation, there has been no injury to any member of the public.
20. Remember Three Mile Island!
21. Nuclear power is the sure path to a wealthy society.
22. The soft energy path will lead us to a pollution-free society with beautiful, small communities throughout the nation.
23. Our rock band performs benefit concerts for nuclear power.
24. All those anti-nuclear activists are alike. They want to stop progress; they want to stop our nation's economy.

LESSON SIX:
TEACHERS KEY FOR STATEMENTS OF INFORMATION

1. Desire
2. Attention (slogan)
3. Attention (slogan)
4. Attention, Confidence (slogan)
5. Urgency, Attention (slogan, numbers)
6. Confidence
7. Urgency (numbers)
8. Confidence (camaraderie)
9. Confidence (camaraderie)
10. Attention (slogan, numbers)
11. Attention (slogan, confidence)
12. Urgency (exaggeration)
13. Urgency, Attention (slogan)
14. Confidence (numbers)
15. Attention, Urgency (numbers, exaggeration)
16. Desire, Confidence (numbers)
17. Urgency, Attention (sensory images)
18. Confidence (status, numbers)
19. Confidence (exaggeration)
20. Attention (slogan)
21. Desire (sensory images)
22. Desire (sensory images)
23. Confidence (recognition)
24. Desire, Confidence (prejudice)

Other Project Ideas:

The following list includes other ideas which you might wish to develop as part of a unit on techniques of persuasion.

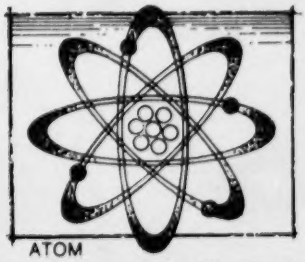
1. Collect newspaper articles about nuclear power. Have students analyze bias, propaganda, ideology, and techniques of persuasion.
2. Stage a debate with people from your community who represent different positions on the nuclear power controversy.
3. Have students design their own advertisements which are either favorable or critical towards nuclear power.
4. Have students design a symbol reflecting their attitude about nuclear power.

VALUES AND NUCLEAR POWER EDUCATION

If teachers needed only to help students understand how energy in the nucleus of an atom can be used to produce electrical power, there would be no issue, no controversy. Many science textbooks explain how nuclear energy is released and put to work. However, most of the texts on the market today avoid considering the controversies that surround the use of nuclear power. In the following pages, we will suggest some techniques for making constructive use of these controversies.

To begin with, let's look at just a few of the questions that come up in connection with nuclear power:

1. In order for our country to be energy dependent, shouldn't we be willing to accept certain risks that may be a part of nuclear energy production?
2. How do you determine the extent to which the risks of nuclear energy actually pose a threat to environmental health? Is nuclear power more or less dangerous than other energy technologies?
3. To what extent are you ready to do without electricity in your life if this country decides to abandon nuclear energy production? Would the absence of nuclear energy cause severe economic problems?
4. What should a worker do when s/he learns that the employing company is allowing risky shortcuts or mistakes to take place in its part of the nuclear industry?
5. What should a utility do if it discovers that one of its workers is taking shortcuts and making construction mistakes?



ATOM
The basic component of all matter; the smallest part of an element that has all the chemical properties of that element. Atoms in turn are made up of protons, neutrons and electrons.

6. If you were opposed to the construction of a nuclear power station or nuclear waste site in your state, should you break the law to prevent the construction?
7. If you were in favor of the construction of a nuclear power station or nuclear waste site in your state, should you break the law to prevent protesters from interfering with the construction?
8. Do federal regulations prevent the nuclear industry from growing as fast as it is capable, thus putting our nation at an economic disadvantage to other countries that have expanding nuclear programs? Or are those regulations necessary for health and safety reasons?
9. Are nuclear wastes easily and safely disposed or do they pose an enormous problem for future generations?
10. Would you give up a well-paying job in the nuclear industry if you felt the industry was putting the nation at risk, even though you knew your quitting would be very hard on you and your family?
11. If you worked for an anti-nuclear group but began to change your opinions about nuclear power, would you publicly state your position even though you would alienate friends and colleagues?

These, and other questions we might pose, point out the need for classroom methods that will meet these objectives:
1. To help students recognize, through expanded experience, moral issues that arise in connection with our production of nuclear energy.
2. To help students clarify, through choice-making, their personal values, especially as they apply to issues concerning the nuclear industry.

3. To help students examine, through projected consequences, their value judgments regarding questions about nuclear energy.
4. To help students develop their ability to make rational decisions from their examined values.
5. To help students become more tolerant of various points of view regarding unresolved questions and conflicting data related to nuclear power generation.
6. To help students take actions that will further clarify and publicize personal value judgments.

These objectives cannot be met through the use of one technique alone. Fortunately, several methods of teaching about values have been developed. The following pages will provide examples of these methods as they can be applied to nuclear energy issues.

Valuing techniques, in general, do these things:

1. State as clearly as possible a conflict of terms, ideas, or practices in such a way that students can imagine possibilities and begin almost immediately to react. Real-life situations are apt to be more engaging than those that are highly unlikely or purely fantastical. Conflicts may be presented by way of moral dilemmas, description of controversial issues, or "just suppose" situations, such as role-playing. Participants are encouraged to ask questions about the conflict so that it is clear in their minds before they begin any activity.
2. Allow free choice by students from among alternatives. The alternatives may either be generated through brainstorming by the class or they may be supplied by the teacher. The point is that as one makes a choice freely among alternatives, s/he confronts certain fundamental ideas that are held as standards or principles. No one freely makes a choice without some reason. However vague in the mind that reason may be **Values are the reasons for action:** action in valuing exercises is choice making.
3. Probe the reasons for making a given choice by having students discuss the choices in small groups and/or by having the teacher raise questions about the choices. Listing choices so that they are visible to all and then listing reasons for the various choices is a customary part of valuing techniques. The techniques vary from one another mostly in the way this probing phase is carried out. These variations are described below under the titles usually given to the different techniques.
4. Wrap up the points of view without necessarily reaching a consensus or drawing a conclusion. Valuing is a life-long process. Talking about conflicts initiates and furthers the process; it doesn't conclude it. By summarizing the points that have been made, asking for written comment on the discussion, or posting the results of surveys, etc., and then taking up a closely related concept that is part of the course the teacher closes off the discussion and moves on. Presumably, the issue continues to prompt further reflection by the students and may eventually lead to projects for the class or public affirmation in some way that evidences how the students have become more aware of their values and more concerned about the principles involved in the issues.

From this overview, we can draw out two things: what values are and how valuing activities can be constructed.

Values are those standards and principles we use to judge the worth, desirability, and goodness of a person, object, idea, action, or situation. To construct activities that promote the identification and enhancement of values, the teacher will need to (a) select for discussion topics that have a certain measure of engaging controversy; (b) review the literature on the topic (news magazines and special interest magazines will be especially useful); (c) identify the value criteria that are best illustrated by the topic (that is, does the central issue concern moral behavior, the environment, the economy, health and safety, fair play, quality of life, etc.); (d) present the topic in an appropriate activity format designed to fit the ability level of the students and tailored to the time available; and (e) prepare to wrap up the activity with a discussion. These steps are illustrated in the examples that follow.

VALUING TECHNIQUES

VALUES CLARIFICATION

The simplest, shortest technique that will help students recognize their own values are called clarification strategies. In these strategies a problem is posed and each individual in the class responds by acting in some way, usually on paper. The responses are then compared and discussed by the class, but without challenging the reasons given for the various responses. The end result of a typical clarification exercise is that students are more aware of their concern or lack of it, the uncertainty or inconsistency in their judgments, their tendency to drift, conform, dissent, or play roles when a topic is brought up that challenges their rational judgment. Thus, the individual learns something about his or her value system.

In values clarification exercises, the emphasis is on "would you?" "do you want?" "do you like?" etc., rather than on "should you?" or "ought you?" In fact, this is one of the limitations in values clarification strategies—they do not probe the moral dimensions of an issue. There are better methods for getting at the moral aspects and these will be described later.

Values Clarification I. Hand out copies of the activity sheets and have students follow directions. After students have marked their maps, you can project a copy of the map on an opaque projector and record the number of campers in the various places so that the whole class can see the distribution (or you can ask students to come up and place their X on the projected map). Then ask the class to volunteer some of the factors that influenced their decision. Some typical responses might be: nuclear plants are dangerous, nuclear plants pollute rivers, we don't need more nuclear plants, we need more electricity, construction will be good for the economy, demonstrations don't make any difference, or it's up to the landowners and the power company, etc.

From here you can go into discussion of energy needs, the impact of industry on land values, environmental considerations, design of nuclear plants, energy needs, or some other topic that is part of your regular course. (See worksheet page **24**.)

Values Clarification II. Hand out worksheets to students and have them complete the form. After students have marked their sheets, find out which are most strongly disagreed with. Ask students to list the probably positive and negative effects in the event that the most strongly agreed with statements in each group were translated into action by that group. (See worksheet page **25**).

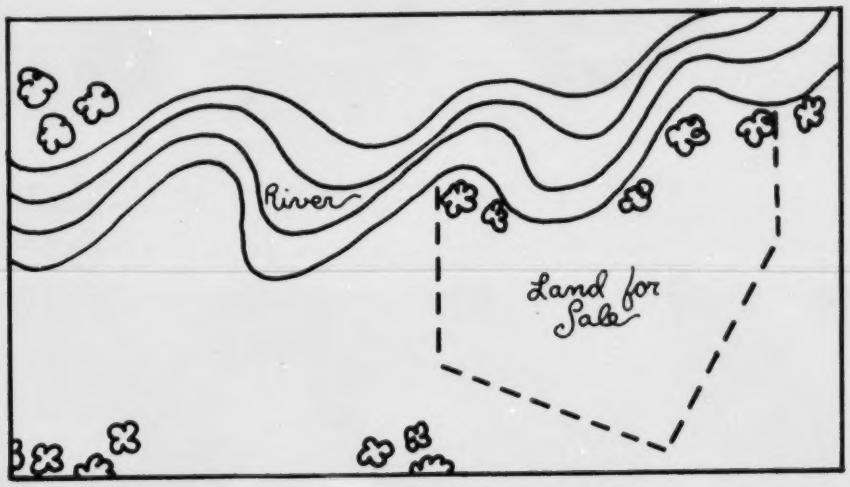
Values Clarification III. Art Clement, Colebrook Academy, Colebrook, New Hampshire, designed the following clarification activity (for use in a unit on electricity in his physics course). While it is only tangentially about nuclear energy, it is a good example of an exercise format adaptable to many issues. This activity is continued in the Values Analysis Section. (See worksheet page **27**).

Values Clarification IV. Beth Stephenson, Boylston Elementary School, Boylston, Massachusetts, developed this values clarification activity which incorporates the features of a simulation activity. The student should be posed the following problem and then asked to be part of a discussion by playing one of the outlined roles. Ten roles are included below. In a large class, more than one student can be asked to play each role. (See worksheet pages **28**).

VALUES CLARIFICATION STRATEGIES

WORKSHEET: VALUES CLARIFICATION I

Suppose that land is being purchased by a power company for eventual construction of a nuclear power station. The owners of the land have agreed to sell. Local citizens opposed to the sale of the private property to the power company decided to camp out on the land to demonstrate their opposition. Other citizens in favor of the sale decide to camp just outside the area to show that they support the transfer of property.



Place an X with a circle around it to show where you would pitch your tent. If you would not take part in the campout at all, place your X on the other side of the river. If you are not sure what you would do, you can mark your X with a question mark. Let your X represent the strength of your feelings by placing it in, near, or away from the center of the land that is for sale.

WORKSHEET: VALUES CLARIFICATION II

A nuclear plant is under construction in your area. The people opposed to the construction are deciding how to demonstrate their feelings. These are the methods they have come up with so far:

_____ Stand quietly with placards outside the fence
_____ Refuse to pay electricity bills
_____ Form a tight line across the gate to stop workers from entering
_____ Lie down in the roadways so trucks cannot pass
_____ Tear down the fence
_____ Use legal procedures in court or at hearings to stop construction.
_____ You may add other steps this group might take.

Keene Sentinel Photo—David Lord

Keene Sentinel Photo—Dayton Duncan

The people who are in favor of the construction are deciding how they can show their support of the power company. So far they have come up with these things:

_____ Stand quietly with placards outside the fence
_____ Work with the police to remove protestors who demonstrate
_____ Work with police to remove protestors who obstruct workers or traffic
_____ Threaten the protestors
_____ Attack the protestors with sticks or rocks
_____ Use legal procedures in court or at hearings to encourage construction
_____ You may add other steps this group might take.

There are people who are not involved in the conflict because they say that:

_____ These decisions are made by scientists and engineers who know what they are doing
_____ These decisions are made by powerful industries that do not respond to public pressure
_____ These decisions are unimportant; it doesn't matter whether the plant is built or not
_____ You may add other beliefs this group might share.

First, decide which group you would be in. Then put "1" next to the statement that you agree with most strongly. Put "2" next to another statement you can also agree with, but less strongly. Put "0" next to the statement for your group that you disagree with most strongly.

WORKSHEET: VALUES CLARIFICATION III

A public utility company in New Hampshire is planning to purchase electrical power from Canada. There are two routes under consideration for constructing the high power transmission lines required. One is through Colebrook, N.H.

List some of the probable positive and negative effects or questions you have about running the lines through Colebrook.
(The teacher lists these items on the board.)

On the scale below, place a mark that best represents your opinion of the proposal to run high tension lines through Colebrook.

Opposed to Transmission Lines in Colebrook

Don't Care

In favor of Transmission Lines in Colebrook

THE WASTE STORAGE PROBLEM: VALUES CLARIFICATION IV

The state of Massachusetts has decided to take the lead in nuclear waste management by taking responsibility for storing low-level wastes that are generated within the state. It is planning to build a waste storage site that will be comprised mainly of waste that is generated in two Massachusetts nuclear power plants and by other industrial research facilities.

However, there are some low-level waste sites in the country (West Valley, New York, in particular) that have experienced leakage of waste material and the escape of radiation. These sites have been poorly managed and the waste containers have been unsafe. In some cases, the waste containers have not been properly stored.

Yet, a committee of experts including prominent scientists, engineers and policymakers have determined that using state of the art technology, a waste site could be constructed in Massachusetts that would not pose any health danger to the commonwealth. They believe that by developing appropriate safety guidelines, waste generating industries will be compelled to adhere to rigid safety regulations. Their recommendation is that careful planning will result in technically efficient waste disposal. They believe that a low-level waste site should be constructed in Massachusetts, because it will be of economic benefit to the state.

The site chosen for the new waste dump is the Higgins Farm in Princeton, Massachusetts. The geology of the area, the depth of the water table, and the rural setting combine to make this an ideal site. But some people living in and near Princeton oppose the waste site because they are worried about the health and safety risks, the long range environmental impacts, and a potential decrease in property values. Others feel that the site may represent an economic bonanza for the community. Businesses will be encouraged to locate in the area and the project will bring much needed federal assistance money.

In several weeks, the people of Princeton and vicinity will vote to accept or reject the waste site. Each student will select a role card. S/he will then be asked to discuss the role and to announce how s/he would vote in the election. Students should be given approximately fifteen minutes to discuss their position before announcing their final votes.

1. Betty Higgins is the owner of Higgins Farm. She will gain an appreciable amount of money if she sells the farm to the state. She plans to sell her land anyway and she will make three times as much money if she sells it to the state than she would if she sold it to housing developers.

2. John Witofsky has applied for a construction job at the site. He is aware of the difficulty of finding employment in his hometown and is counting on this new job to get started.

3. Jane Lincoln has been arrested for demonstrating against the storage site. She is a mother of three, has lived in Princeton all her life, and is very concerned about the environmental impact of the site.

4. Joe Walsh runs the Mount Wachusett Animal Farm which is adjacent to the Higgins Farm. He is concerned that the dump will reduce the number of visitors to the farm.

5. Herb Wilson is a local businessman. He is aware of the difficult economic times that face the town and he believes that the waste dump would greatly improve the town's economic security.

6. Mable Schneider is an environmental engineer who is a prominent environmental consultant. She has carefully examined the plans for the site and she is convinced that it poses few safety risks, if any, to the people of Princeton.

7. Charlie Hilton is a physicist and a member of the Union of Concerned Scientists. He has investigated some of the problem sites around the country and he believes that there is not enough techical knowledge to insure the safety of any site. He strongly recommends that the site should not be built.

8. Catherine Brunelle is the mayor of Princeton. She does not yet have a strong position, but she is a highly respected member of the community. She is anxious to get as much information from other townspeople as she possibly can before she makes her final decision.

9. Langdon Reed is a journalist who has been covering the nuclear power controversy for years. He is not trusted by either the pro or anti-nuclear people as no one can really figure out where he stands. This issue is different; it may be located in his hometown.

10. Mark Fernsten is a star hockey player who resides in Princeton. He has been an outspoken anti-nuclear activist in recent years. Although his statements are always inflammatory and controversial, no one doubts his sincerity.

VALUES ANALYSIS

This technique carries the valuing process a step beyond clarification by challenging the student to support his or her choices with relevant facts and rational arguments.

There are five steps in a values analysis which taken together lead to rationally defensible judgments.

Step 1. The teacher presents a conflict situation. Students, of course, may bring up a good starting point spontaneously and the teacher can capitalize on that raised issue. Some amount of clarification of the issue may be necessary. Specific cases or examples to consider usually make the problem clear.

Step 2. Students do research to find relevant facts that will help them make a value decision on the issue. This is a good time to point out the difference between observed facts and evaluative statements (opinion). Both are used in reaching rational decisions. As information begins to collect, students may "specialize" in some areas, but all information is shared fully.

It will be necessary to organize the information according to **valence. Valence** refers to the relative importance of a piece of information—the more significant the information appears to be, the higher valence a person assigns to it. A student reveals to himself and to others something about his values by the valence he assigns to data or opinions. In addition to having high or low valence, information will have negative and positive valence. That is, it will suggest what is bad or what is good about a particular thing, action, or situation. Even factual data have valence in both of these senses: (a) may be very important or of minor importance, and (b) may suggest something bad or something good that can come from a given decision.

The idea of valence will be clear if we apply it to the accident at Three Mile Island. A person who values national energy independence would probably look at the data and opinions about his accident and assign fairly low valence to it, saying, for instance, "Well, no one was killed by the accident (low, but positive valence)—that shows how safe these plants are even when things go wrong" (high, positive valence). On the other hand, a person who values health and safety highly would probably assign the same data and evaluative statements high and negative valence, and say, "You see? It's just a matter of time before even the most carefully constructed plant and sophisticated controls will fail to contain an accident (high, negative valence)—we do not have the technology to do what we're trying to do" (high, negative valence).

Students will need to record in some way each piece of information turned up in the research and rank it by importance and by relevance. The worksheet provided presents a useful format. See—Worksheet: Values Analysis Step 2.

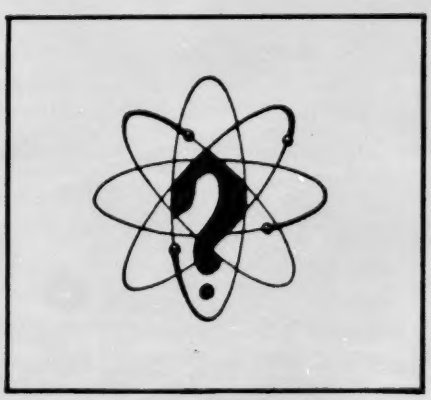
In arranging the information, students will be showing the value criteria that are used in stating a value principle. **Criteria** are such concepts as it is wrong to cheat, lie, steal, kill, hurt others, or good to keep promises, pay debts, be safe and healthy, reduce risks, protect the environment, meet society's needs, etc. **Value principles** are judgments one makes in order to arrive at a decision in a given issue. For instance, if one concludes that nuclear plants are justified, the value principle operating may be that the few accidents that have occurred in nuclear plants justify continued development of the industry since there is risk in everything (one of the student's criteria) and so far nuclear risks have been minor compared to the benefits reaped by society.

Step 3. Students will need to decide the truth and falsity of collected information. This means they will have to judge the sources, the amount of agreement among experts, and the relative strength of contradictory information. This step contains nothing new to students or teachers; it is plain good sense to weigh the truth of information as best you can when you are going to use it to make decisions. The student uses the evaluated research information to make initial value judgments. (e.g., "mountains of coal waste will be bad for the environment," or "uranium mining is safer and healthier than coal mining.")

Step 4. Each student uses his or her recorded information, ranked by importance, relevance, and validity to arrive at a tentative decision in the issue.

Step 5. The tentative decision can be tested to see if the value principle(s) underlying the decision is sound and consistent with the values expressed by the student. One way to do this is for the teacher to ask each student if the general principle (say, industrial risks are outweighed by social benefits) can be applied to other situations (manufacturing medicines, for example), or by people who will be negatively affected by the decision (will people who live near nuclear plants be able to accept the principle that the risk of an accident is outweighed by the benefits of abundant electricity?). If the value principle only fits a narrow situation, then it probably is not an acceptable principle and the student deserves to have this pointed out so that s/he can do further thinking about it. Of course, the teacher does not say that the principle is bad or wrong, only that another principle may cover the present situation and also be more widely applicable.

This description of the five steps may make it seem that value analysis is a long, drawn-out process. In fact, if research information is readily at hand, it need not take more than a period or two to decide an issue. The length of time it takes depends on the complexity of the issue under consideration. It is therefore wise to keep to fairly narrow issues (as contrasted with values clarification issues which can be quite broad).



WORKSHEET: VALUES ANALYSIS STEP 2

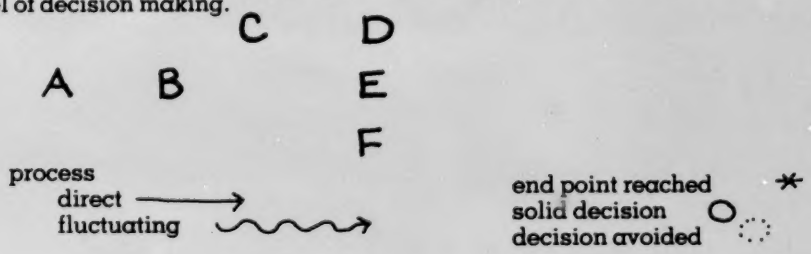
BASIC CONCERNS	POSITIVE INFORMATION	NEGATIVE INFORMATION	INITIAL VALUE JUDGMENT
(For example: need for energy, environmental protection, health and safety, economic concerns, etc.)	(Arrange according to importance and relevance)		

VALUES ANALYSIS PROBLEMS

1. Should the United States proceed with its planned construction of a breeder reactor at Clinch River, Tennessee? (In the clarification step, the design of a breeder reactor and the properties of its plutonium product should be described.) The teacher may want to collect resource material ahead of discussion.
2. Should the United States proceed with its planned construction of a central depository for permanent storage of nuclear waste? (Again, the teacher may need to be prepared to explain the current thinking on waste storage and line up appropriate resources.)
3. Is coal a suitable alternative to nuclear generation of electricity? (This question should be considered on a regional basis.)
4. In the unit developed by Art Clement (see Values Clarification example #3), after students have considered positive and negative effects of transmission lines, they are divided into two (possibly three) groups—those supporting and those against (and perhaps those who are neutral). Based on assigned readings about transportation of electricity, groups cull data and evaluate statements to formulate reasons supporting their case. These are then presented orally in an attempt to persuade other groups to their way of thinking. Each group makes its best case.

   Clement anticipates that the counter arguments will produce the required test of values principles embedded in the decisions each group has made. In the "debate" session, each student will hear statements that should cause him or her to reflect further on the reasons (principles) s/he has employed in reaching a decision.
5. Marjorie McCandless, a student at Antioch/New England Graduate School, developed the following values analysis activity. Note that the research and prioritizing involved here is in the form of self examination. In that way, this activity resembles a moral dilemma (see Worksheet V).

(To the Teacher) After students have completed their stories, ask them to share them with the class. Put this diagram on the board and ask students to point out how their stories fit the general model of decision making.



A. The period of time before a person is confronted with a dilemma or choice-making situation.
B. The dilemma, or point of choice making
C. The decision to avoid making a choice (avoiding the nuclear debate).
D. The decision to be strongly in favor of something (contribute to the development of the nuclear industry).
E. The decision to be neutral about the issue or choice-making situation (take a balance position).
F. The decision to be strongly opposed to something (argue against development of nuclear industry).
~~~ Fluctuations between the two opposing points of view (to be in favor of nuclear power at one time and opposed to it at another).
✳ The satisfactory solution to the choicemaking process.

Help students to see that events and relationships in one's past may have long-range effects and influence decision-making indirectly.
~~~

WORKSHEET:
VALUES ANALYSIS PROBLEM V

This is an unfinished story. Read Terry's story all the way through (skip over the blank lines). Then look over the four endings. Select the ending that appeals to you.

After you have selected an ending, go back to the blank lines and fill in some events that could have occurred earlier in Terry's life that influenced his later decision (your selected ending).

Finally, describe the ending. For each ending, there are some questions that will guide you in finishing the story. The class will listen to some of the stories and discuss the events that led to the different endings. You will judge the stories according to how plausible the events are and how appropriate the endings are given the events in Terry's life.

. . . . . .

Terry grew up on a dairy farm a few miles from the Three Mile Island nuclear plant. He was a top science student in high school, an enthusiastic fisherman, and enjoyed white-water canoeing and bicycling. _____

_____

_____.

Terry was a senior when the accident occurred at TMI. Several families set up tents in the farm pastures when they were forced to evacuate the threatened area. Despite the fear and generally negative feelings these temporary neighbors expressed, Terry maintained that nuclear power was essential and that plants like TMI were necessary. _____

_____

_____

Following graduation, Terry entered the engineering school at the University of Pennsylvania. He graduated with honors and began an advanced program in nuclear engineering. Nuclear engineers took a lot of criticism by other students who were opposed to nuclear power. Terry's girlfriend, Anne, a law student, was one of those who wanted to see all nuclear plants closed for good. _____

_____

_____

Anne's influence was strong in Terry's life. He admired her hard work in the anti-nuke group on campus, but his training in nuclear technology gave him confidence that nuclear plants could be built and operated safely. As the time approached for Terry to leave the university and find a job, he was unclear whether he wanted to continue in the nuclear field. _____

_____

_____

Now you finish the story...

A. Terry abandons nuclear engineering and returns to the farm. He likes farming and his training as an engineer gives him some good ideas for developing the dairy operations.

1. What could happen to convince Terry that this is the best choice he could have made?

2. Is there something that could occur to make Terry decide to enter the nuclear field again?

3. If so, what could happen and how would Terry react?

B. Terry accepts a job in the nuclear fuel development division of Westinghouse Electric Corporation.

1. What could happen to convince Terry that this is the best choice he could have made?

2. Could anything happen to make Terry question the appropriateness of the nuclear industry?

3. What, if anything, could Terry do to act on his concerns?

C. Terry becomes a teacher in a small engineering school in North Dakota. Because of his training, he is assigned to courses in nuclear engineering. He tries to point out to his students both the weaknesses and strengths he sees in modern fuel and reactor design as well as waste reprocessing and storage. He tries to maintain a fairly neutral position on nuclear power as an industry.

1. What could happen to convince Terry that this is the best decision he could have made?

2. What might make Terry become less neutral and more opinionated about the nuclear industry?

3. How would he voice his opinion?

D. Terry marries Anne and together as engineer and lawyer they become active workers in a group dedicated to convincing people that there are good alternatives to nuclear power.

1. What could happen to convince Terry that this is the best choice he could have made?

2. What could happen to cause Terry to become an advocate of nuclear power?

3. What could he do to convince people to accept more nuclear plants?

A moral dilemma arises from a conflict of duties. A person in a moral dilemma finds it impossible to do one of his duties without failing to carry out another of his obligations. An employee accepts the duty to do what his or her job requires. When told by a boss that s/he must perform in such a way as to save the company money even if the product turns out to be unreliable or even unsafe, the employee **may be** in a moral dilemma. If a worker sees some slipshod workmanship in a nuclear plant construction project receive approval by supervisors who should know better, the worker **may be** in a moral dilemma.

One must first be aware of the conflict in his or her obligations before a moral dilemma exists. Therefore, one needs to have one's values fairly clearly in mind if one is to recognize and resolve a moral dilemma.

Teaching about values through moral dilemmas reverses the process. The dilemma is first recognized and from that given situation values are examined.

Before we look at the classsroom teaching techniques, we need to look briefly at some research that Lawrence Kohlberg, Harvard psychologist, has done regarding moral development. According to Kohlberg's studies, human beings process through a sequence of moral stages. Like the stages of physical growth, moral growth stages are averages. Not everyone grows at the same rate morally or to the same extent.

Any description of Kohlberg's stages is likely to fall short of the complete picture, but for teaching purposes the stages may be summarized in this way:

Stage 1. The person sticks to rules in order to avoid punishment, or is obedient because obedience is good and right for its own sake. A high value is placed on authority and on the inevitability of punishment for wrongdoing. The stage is usually not dominant beyond age 10-12.

Stage 2. The person follows rules only when it is in his own interests; he tries to meet his own interests and lets others do the same. Right is seen as relative. High value placed on fairness, agreements, or equal exchange. This stage begins to dominate at about 7-8 years and continues through grade school.

Stage 3. The person strives to live up to what is expected of a good son, brother, or pal. High value placed on being a good person in one's own eyes and those of others. **Golden Rule** highly valued. General support of stereo-typical behavior. Stage 3 is dominant during adolescence and remains a major stage for most adults.

Stage 4. Person recognizes the societal points of view and strives to live up to the demands of society and its institutions. High value placed on contributing to society generally or some group or institution; keeping the system going is important. In Stage 4, the person considers individual relations in terms of their place in some accepted system. This stage begins in mid-adolescence and continues to be the dominant stage for most adults in our society.

Stage 5. Person is aware that people hold a variety of values that are relative to their group. Places high value on relative rules as part of the social contract, not because they are absolute or permanent. Recognizes that he enters contracts and agreements freely. Places high value on laws based on "the greatest good for the greatest number." Since Stages 5 and 6 result from exposure to and understanding of moral philosophy, they appear to be natural in only some adults.

Stage 6. This person follows ethical principles chosen by himself and he places high value on the rational process in decision-making. He feels he has discovered or understands universal moral principles and is committed to them.

From this overview it may be clear that only the first stages are of primary concern to teachers, and that the stages themselves are judged by their adequacy in handling situations. No moral stage is "wrong" for a person, but that person may be able to consider problems in a more adequate way if s/he can be advanced to a higher stage than the one that is presently dominant.

10 The Keene Sentinel Thursday, Feb. 11, 1982

Defective welded parts found in Seabrook reactor; 3 workers fired

SEABROOK (UPI) — A contractor at the $3.6 billion Seabrook nuclear plant site has fired three workers after a routine inspection found several defective welded parts in the reactor building.

Public Service Co. Spokesman Norman Cullerot said today that Perrini Construction Co., a concrete and reinforcing steel contractor from Boston, has fired the workers. Their names will not be released, he said.

"We hope it doesn't go any further than this," Cullerot said. "There is an investigation under way and hopefully it will be concluded with this."

Less than 10 of 100,000 so-called "sister cadwelds" appear to be defective, Cullerot said.

These test parts are built next to welded joints that hold together 2¼-inch steel support rods, he said. The steel rods run through the containment building, strengthening the concrete.

Cullerot said the test joints can be torn apart to test the integrity of the actual joints or cadwelds.

Cullerot said the repair cost could not be determined until after a full investigation. He said it could cost almost nothing, however, if the problem is limited to the test parts.

The extent of the problem will not be known for several weeks, he said, but the Nuclear Regulatory Agency has been notified.

"This discovery does not necessarily mean that faulty production cadwelds exist, only that the checking system has been deficient," Cullerot said.

"Since each cadweld is numbered and registered, it will be possible to find exactly where the improper testing occurred. We will then be able to determine what corrective steps are needed," he said.

Moral Dilemma: An Example

Sam Johnson, a nuclear construction supervisor, has evidence that several of his workers have made construction mistakes in a part of the plant that poses no safety danger. Nevertheless, he is concerned about these mistakes because he wonders if the same mistakes might be repeated in very important areas of the plant. Ordinarily, Sam would have the mistakes corrected, but he is very concerned because plant construction is behind schedule. This has raised several problems. There is increased public pressure to complete the plant. The investors who have contributed a great deal of money to the construction project wish to see some results. Sam knows that these mistakes won't cause any problems if he doesn't report them, but he is also aware that if they go unreported, the workers might be getting the wrong message. Yet if the mistakes are reported, it might leave a bad public impression and more valuable time will be lost. The last thing that the utility needs is another building delay. What should Sam do?

This dilemma especially highlights moral development stages two and four. If the person was acting according to stage two, he might decide not to report the construction because in the long run it would cause the least amount of damage to himself and the company. He acts primarily in the interest of the company.

Stage four concerns the importance of one's action in relationship to the societal point of view. Sam might decide (as part of his stage four thinking) that he must act in the broader interests of society in this case. He must report the construction mistake, even if it jeopardizes the financial security of the utility.

This example points out the importance of the discussion of moral dilemmas. The discussion must allow free expression of voluntary solutions and then the teacher needs to probe to help individuals in the class consider new possibilities.

Where values analysis puts emphasis on prioritizing information, moral dilemmas put emphasis on ranking the consequences of a decision. Concentrating on consequences causes students to reflect on the moral values they hold. As a result, moral values become more clear, and the student may be able to see the possibility of another (higher) moral stance.

HANDLING MORAL DILEMMAS IN THE CLASSROOM

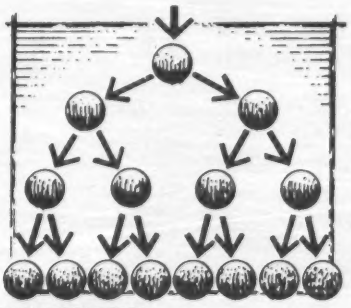
Following the presentation of a moral dilemma, hand out the student worksheet.

1. Working in small groups (or as a whole class), students volunteer courses of action open to the protagonist while a recorder (or the teacher) writes them in the first column.

2. Students project consequences of each course of action. Through discussion, and perhaps some research, students attempt to show how likely it is that each consequence will occur. Numbers are assigned to consequences to indicate likelihood.

3. Students now rank the consequences according to how desirable each one is. Desirability may be quite independent of likelihood. At this point the teacher may need to suggest some criteria that are useful in judging desirability. These may include some or all of the following:
moral—to what extent would the lives and dignity of others be enhanced or diminished?
legal—would laws be broken?
economic—how much cost would be involved?
health and safety—would the lives of self or others be endangered?
environmental—would the natural surroundings be harmed or helped?
aesthetic—would the beauty of something be increased or reduced?
inquisitional—would the freedom and inclination to inquire objectively into a subject be enhanced or diminished?

4. The groups, or the class, decide on the appropriate course of action. The consequences, their likelihood and their desirability, are the basis for this decision. Sometimes, individuals will find their moral values compromised by the class decision. These minority opinions deserve respect. In a moral dilemma, individual decisions, not those of a group, are what matter. The only reason for striving toward a group decision in the classroom is that the discussion provides challenges which may stimulate individuals to reflect further on their moral stance. It is important that everyone try to understand each valid point of view, but it is not at all necessary that one point of view be accepted by all individuals.



CHAIN REACTION
A self-sustaining series of events occurring when a neutron splits an atom releasing sufficient neutrons to cause many other atoms to split in the same way.

WORKSHEET: MORAL DILEMMA

ALTERNATE COURSES OF ACTION	CONSEQUENCES	DESIRABILITY
1.		
2.		
3.		
4.		
5.		
6.		
7.		

MORAL DILEMMA I:
A JOB IN THE NUCLEAR INDUSTRY

1. Ed Stockman, Belmont High School, Belmont, New Hampshire, developed this moral dilemma.

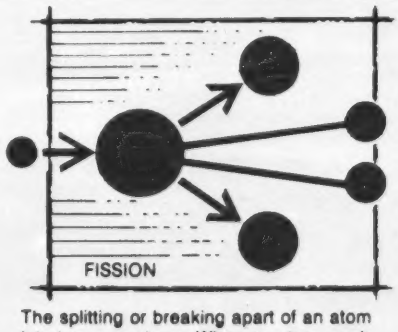
During his college years, John was an anti-nuclear activist. After graduating, John entered the computer field and was employed for ten years by Allied Industries. Many of the friends he developed had great faith in nuclear power technology. They were confident that the numerous back-up safety systems made the likelihood of a serious accident extremely low. They also pointed out how no member of the public had ever been killed by a nuclear power plant accident. This was certainly different from the situation in the coal industry. John became less of an activist, but remained concerned about nuclear power safety issues. Presently, John is the chairperson of his church committee on nuclear plant safety and waste disposal. He tries to have the committee consider the issues objectively and sees himself as a reasonable person who seeks nonconfrontational ways to resolve conflicts.

The recent economic crunch caused problems for Allied Industries and the administration found it necessary to terminate many positions. John was one of many to lose his job. John is married, has two sons and until he lost his job was reasonably financially secure. Now, he cannot pay his bills.

John has been job searching for eight months and he has almost completely exhausted both his financial and emotional reserves. An acquaintance, who works at a local nuclear power plant, tells him of a job for which he is qualified. He is hesitant, but applies and goes to the interview because he feels it will give him experience at interviewing. John is offered the job. Should he accept the position?

Stockman has proposed these questions for following up the discussion of the dilemma:

a. Why should John take or not take the job?
b. What are John's principles?
c. If John takes the job, what would the consequences be?
d. If John does not take the job, what would the consequences be?
e. Should John take the job just because it provides him with the resources to pay his bills?
f. What happens when people compromise their principles?



The splitting or breaking apart of an atom into two new atoms. When an atom, such as uranium, is split, large amounts of energy and one or more neutrons are released.

MORAL DILEMMA II:
TRANSPORTING HIGH LEVEL WASTE

2. The Nuclear Regulatory Commission has ruled that spent fuel from nuclear reactors cannot be transported through urban areas. The trucks or trains carrying nuclear waste must travel at least three miles from the borders of cities with more than 100,000 people. Mayor Shinn of River City (population: 13,000) learns that a proposed route for trucks carrying nuclear waste runs through River City to avoid Kansas City 25 miles away. He understands why nuclear waste should not pass through large cities. In case of an accident, the spilled radioactive waste could endanger the lives of the city's crowded population. However, he also has seen movies of tests done on specially designed trucks carrying nuclear wastes. Trucks were run into concrete walls at eighty miles an hour while carrying radioactive waste containers. And containers were dropped onto iron spikes to test their sturdiness. There was never any damage to the containers. The tests seem really convincing.

Mayor Shinn does not know what to do. He knows that an accident in a concentrated area would threaten more people than one in a small town. But he's concerned that an accident in River City would threaten hundreds of people he knows personally. On the other hand, he recognizes that the probability of an accident is very low. Even if there was an accident, there would be little chance of radioactive waste leaking from the container. And he certainly realizes how much safer the driving conditions are in River City as opposed to Kansas City.

The City Council of River City votes and is evenly divided over the issue of approving the proposed route. Mayor Shinn must cast the tie-breaking vote to decide the issue. How should Mayor Shinn vote?

Low level waste management—France.

Suit filed over radiation deposit

By United Press International

PITTSBURGH — Neighbors of a site containing an es- material — some of it timated 500,000 tons of radi mic weapons — used in developing the nat injuries filed federal class action to their health and prope

Thirty-nine residents burg Industrial Park ir plaintiffs in two suits burgh, but their atto or own property wi by the claims. Two

The suits name six governmental fendants. They contaminated m

11,000-plus located 22 miles southwest of Pittsburgh, ing processing of radium and uranium in the 1940s 1950s by a Vitro Rare Metals plant under govern contract have contaminated material at the indu park and off-site residential and business property.

"The present amount of radioactive materials, a sultant radiation, constitutes a severe health haz of this area, has substantially diminish ty located in the immediate ar the value and profits area," the suit Energy,

Bill on N-waste disposal gets State House backing

■ NUCLEAR

Continued from Page 17

The bill must be reported out of Ways and Means and approved houses of the Leg law.

declarations by South Caro vada and Washi only

FOR MORE INFORMATION

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